

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 Claim 1 (original) An automated testing method for use in
2 a communications network with a plurality of different
3 clocks, the method comprising:
4 storing clock error information for said plurality of
5 different clocks;
6 monitoring a plurality of network points to detect
7 events;
8 generating a set of test results including detected
9 events and corresponding event times, at least some of said
10 event times having been obtained from timing information
11 corresponding to different clocks;
12 processing said set of test results to generate set of
13 timing corrected test results, said processing including
14 modifying at least some event times as a function of said
15 stored clock error information;
16 comparing events and corresponding event times
17 included in the set of timing corrected test results to
18 expected events and corresponding expected event times
19 included in a set of expected test results; and
20 generating a set of test result information including
21 information indicating differences between the set of
22 timing corrected test results and expected test results.

1 Claim 2 (original) The method of claim 1, further
2 comprising:
3 storing a set of relative timing test results, said
4 set of relative timing test results including expected
5 events and relative event times corresponding to the
6 expected events, said relative times being expressed

7 relative to at least one of a test stimulus time and a
8 preceding expected event time; and
9 processing said set of relative timing test results
10 using stimulus time information to produce said set of
11 expected test results, said expected event times being
12 generated as a function of said stimulus time information
13 and said relative times.

1 Claim 3 (currently amended) The method of claim 2,
2 wherein said step of generating ~~as a~~ a set of test result
3 information includes identifying, as a function of said
4 comparing, detected unexpected events and undetected
5 expected events.

1 Claim 4 (original) The method of claim 3, wherein detected
2 events included in said set of timing corrected test
3 results are identified as detected unexpected events if the
4 detected event and the timing associated with the detected
5 event do not match an expected event and the timing
6 associated with said expected event.

1 Claim 5 (original) The method of claim 3, wherein
2 undetected expected events are events included in said set
3 of expected test results which are not detected in the set
4 of time corrected test results at the expected time.

1 Claim 6 (currently original) The method of claim 5,
2 wherein said step of generating ~~as a~~ a set of test result
3 information includes identifying, as a function of said
4 comparing:

5 expected undetected events which include events in the
6 expected test results which are not found in said set of
7 time corrected test results.

1 Claim 7 (original) The method of claim 6, where said set
2 of expect test result includes lists of expected events
3 arranged based on causal dependency; and
4 wherein said step of generating a set of test result
5 information includes listing at most one undetected
6 expected event corresponding to each list of expected
7 events arranged based on causal dependency included in said
8 set of expected test results.

1 Claim 8 (original) The method of claim 1, wherein said
2 stored clock error information includes information
3 relating to clocks included in different routing devices,
4 wherein said set of test results includes detected events
5 corresponding to different network links and wherein time
6 information associated with detected events corresponding
7 to different network links is obtained from clocks included
8 in different routing devices.

1 Claim 9 (original) The method of claim 8, wherein said
2 monitored network points correspond to different points in
3 a system including at least four active network routing
4 devices; at least two monitored network points
5 corresponding to the output of two different network
6 routing devices.

1 Claim 10 (currently amended) The method of claim 9,
2 wherein said four active network routing devices are
3 ~~telephone switches~~ signal transfer points.

1 Claim 11 (original) The method of claim 9, wherein said
2 four active network routing devices are IP packet routers.

1 Claim 12 (original) A testing apparatus for performing
2 communications system testing, said communications system
3 including a plurality of routing devices having different
4 time clocks, the apparatus comprising:

5 timing information corresponding to at least some of
6 said clocks indicating timing differences between said at
7 least some clocks;

8 relative timing expected test results including
9 expected events and relative expected event times, each of
10 said relative expected event times being expressed relative
11 to a test stimulus or another expected event time;

12 an expected results translator module for translating
13 the relative timing information included in said relative
14 timing expected results to actual times as a function of at
15 least one test stimulus time, said expected results
16 translator module producing timing corrected expected
17 results;

18 raw test results retrieved from monitoring points in
19 said communications system, said raw test results including
20 detected events and detected event times obtained from
21 different clocks ;

22 a timing correction module for processing said raw
23 test results as a function of said timing information to
24 generate a set of detected timing corrected results; and

25 an analysis module for processing said timing
26 corrected expected results and said detected timing
27 corrected results to generate a set of test results
28 including information identifying undetected expected

29 results and detected unexpected results, said undetected
30 expected results and said detected unexpected results being
31 determined as a function of a comparison between said
32 timing corrected expected results and said detected timing
33 corrected results.

1 Claim 13 (original) The apparatus of claim 12, further
2 comprising:
3 a report generation module for classifying detected
4 timing corrected events as a function of the comparison
5 between said detected unexpected results and said timing
6 corrected expected results, said classifying including
7 classifying events as detected unexpected events when said
8 detected timing corrected events do not match an expected
9 event.

1 Claim 14 (original) The apparatus of claim 13, wherein said
2 timing information includes clock error information for a
3 plurality of different clocks included in said
4 communications system.

1 Claim 15 (original) The apparatus of claim 14, further
2 comprising:
3 means for detecting events at a plurality of different
4 test points in said communications system, said test points
5 including a point at which said stimulus can be monitored
6 and a point separated from said stimulus point by at least
7 one routing device.

1 Claim 16 (original) The apparatus of claim 15, wherein the
2 communication system is a telephone communication system
3 including at least four signal transfer points, said

4 plurality of different test points including inputs and
5 outputs of at least three different signal transfer points.

1 Claim 17 (original) The apparatus of claim 15, wherein the
2 communications system is an IP packet routing system and
3 wherein said plurality of different test points includes
4 inputs and outputs of at least three different routers.

1 Claim 18 (original) The apparatus of claim 15, further
2 comprising:
3 stored test stimulus information; and
4 means for introducing test stimulus including multiple
5 link failures into said communications system according to
6 said stored test stimulus information.

1 Claim 19 (original) An automated test system for testing
2 communications networks including a plurality of nodes,
3 each of said nodes including a different clock, the test
4 system including:
5 network node clock information including information
6 suitable for synchronizing time values received from said
7 multiple clocks;
8 a set of detected events and detected event times;
9 means for correcting said detected event times as a
10 function of network node clock information to synchronize
11 the time values obtained from different network node
12 clocks; and
13 means for comparing the detected events and
14 corresponding corrected event times to expected events and
15 corresponding expected event times to identify unexpected
16 detected events.

1 Claim 20 (original) The system of claim 19 wherein said
2 means for comparing further identifies undetected expected
3 events.

1 Claim 21 (original) The system of claim 20, wherein said
2 detected events include events corresponding to a link
3 failure, said test system further comprising:
4 means for monitoring the failed link and a
5 communications link separated from the failed link by at
6 least two network nodes including routing functionality.